

COE5222: - OBJECT ORIENTED PROGRAMMING

PROGRAMMING ASSIGNMENT

Make a group of 3 People Maximum

CAR RENTAL BUSINESS SOFTWARE

The Kigali Car Rental Ltd is a medium-size but growing business. They require a car rental system to manage their business. They have four price categories of cars: Economy (E), Budget (B), Midsize (M) and Full Size (F). They also rent specialist cars to wealthy tourists for extended periods.

There are two categories of customers: members and non-members. A member is a customer whose identity and credit-worthiness have been validated by the company. A non-member is a customer whose identity and credit worthiness have not been checked, and who, therefore, must provide a deposit to make a reservation or surrender a copy of their license to rent a car.

1. RENTING FEES

The company charges fees as follows:

- A weekend is defined as the period from 6:00 AM Friday to 8:00 AM, Monday.
- There is no mileage charge for first 250 km each day.
- Any time over one week is computed by prorating the weekly rate.

The current rates are shown below:

Car Type	Daily Charge	Weekly Charge	Weekend Charge	Charge per Kilometer
Economy	20,000RWF	100,000RWF	35,000 RWF	200 RWF
Budget	25,000RWF	125,000RWF	40,000 RWF	300 RWF
Midsize	30,000RWF	150,000RWF	45,000 RWF	400 RWF
Full Size	35,000RWF	175,000RWF	50,000 RWF	500 RWF

2. FRONT DESK REQUIREMENTS

The primary responsibility of the front desk staff is to deal with customer inquiries, reservations, memberships, car rentals, car returns, and payments. Since these tasks are usually performed while the customer is waiting on the phone or at the desk, it is essential that the system is efficient and reliable. Our requirements for the system are outlined below.

- The front desk staff spend a great deal of their time answering customer inquiries about car availability. The system must search for available car Models based on
 - Price Category,
 - Pick up Date & Time, and
 - Return Date & Time.
- After each retrieval, the customer is shown the results as a collection of matching car Models, along with basic information such as carModel name. The customer can then choose to view extra information about particular carModel such as a description and matching car details.
- Cars are rented on a first-come, first-served basis and customers can take their pick from what is currently available. Alternatively, customers who are keen to rent a model of a car which is not available can make a reservation. An assistant will contact the customer directly when a matching car becomes available. The customer must collect it within two days or pay a levy for depriving other customers of the car.
- The customer renting the car may not be the driver, and there could be many drivers. For each driver, the following information needs to be captured: full name, birth date and driver's license number. Information about the third party who may be paying the bill also needs to be captured. Extras such as collision damage waiver, liability insurance, and personal accident insurance may be added for an additional daily charge. A rental agreement consists of an agreement number, the customer's name, type of rate (daily, weekend or weekly), car identification, driver identification, and car price category. It also includes information about the date, time and mileage when car leaves and the expected date and time of return. The car is rented with a full tank of fuel, and the customer is responsible for refueling the car before returning it.
- Returning a car consists of dropping it off. When a car is returned, an amount for fuel is added if the tank is not full. The date, time, and mileage when the car is returned are recorded. The car must be inspected for damage by a staff member. If the collision damage waiver is not accepted at the time of rental, the cost of repair is added to the bill. The car is also inspected to determine the need of minor maintenance. If maintenance is needed, the car is not cleaned up and returned to the rental lot. Instead, it is sent to the shop for needed repairs and maintenance.

- A bill is given to the customer if the customer is present. Otherwise, it is e-mailed to the customer. A 10,000RWF deposit is collected at the time of rental if there is no collision damage waiver. The deposit is either paid in cash or charged to the credit card.

3. MANAGEMENT REQUIREMENTS

For bookkeeping and planning purposes, the system must be able to generate reports for car rentals, for total revenue or for total maintenance cost for any specified period. Management staff will enter a start date and end date, and the system will output a rental report (revenue) or a maintenance report (cost) for that period.

The management need to be able to check whether an individual car is currently on loan, when it is due back, how much is owing on it (if it is overdue), as well as details of who borrowed it (i.e. name, address, phone number, licence number). The management also needs to generate a rental report for a particular member for any specified time period. All system functions should be available to management level staff, but other staff must only be allowed access to the functions required for doing their jobs and no more.

4. ITEM TO BE SUBMITTED

- Systems specifications incorporating problem scope, system goals, basic functionalities, performance needs and assumptions.
- UML diagrams including a use case diagram showing all the use cases in the car rental system.
- The system sequence diagrams for the use cases
- A domain model for the car rental system with attributes associations and multiplicities.
- A complete Java code used to implement the software.